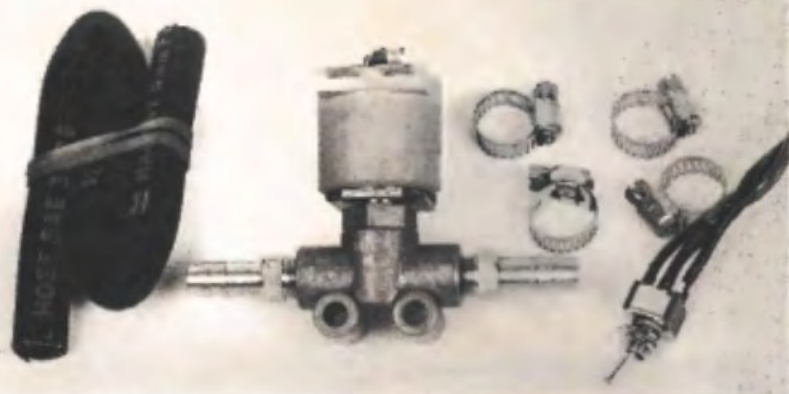


CIRCUIT NOTEBOOK

Interesting circuit ideas which we have checked but not built and tested. Contributions from readers are welcome and will be paid for at standard rates.

Fit a fuel cut-off solenoid to thief-proof your car



The fuel cut-off solenoid is supplied complete with two threaded nipples, rubber fuel hose, hose clamps and a DPDT switch.

If you're one of those people who is not keen on the idea of fitting a car burglar alarm, what about a fuel cut-off solenoid? You might have thought of using an ignition cut-out instead but that is not much good if your vehicle is diesel powered. The fuel cut-off solenoid is the answer.

We have just come across a fuel cut-off solenoid available from Jaycar Electronics (Cat. No. XC-2050). In the unenergised condition, the fuel is cut off. Current drain when the solenoid is energised is about 650mA.

In cars with carburettors, the fuel cut-off solenoid can be installed between the fuel pump and the filter (if there is one). In diesel-powered vehicles, the fuel pump will be a positive displacement type and therefore the cut-off solenoid must be installed before the pump (otherwise damage could result).

Note: in cars with electric fuel pumps, a cut-off solenoid is unnecessary because you can stop the fuel flow by switching off the 12V supply.

The solenoid is supplied with a pre-wired miniature DPDT toggle

switch plus fittings. These include two threaded nipples with tails for push-fitting 8mm rubber fuel hose (also supplied) and four hose clamps.

Installation will vary from car to car but the solenoid assembly can be mounted in a number of ways. It is fitted with a 6mm threaded stud and has two holes drilled in the valve assembly which also could be used for mounting to a panel or bracket. One side of the solenoid coil is connected to the frame so that only one wire needs to be connected to complete the circuit.

There are a number of options for wiring in the solenoid. Fig.1 is perhaps the most comprehensive. One pole of the switch feeds +12V from the ignition switch through to the solenoid while the other pole feeds +12V to a dashboard flasher (Jaycar Cat. No. KJ-7000) when the switch is in the off position. In this way the flasher gives the impression that a burglar alarm is fitted too. (Cunning, huh?). Naturally, the switch should be concealed, as should the wire to the solenoid.

Fig.2 deletes the flasher and substitutes a 12V buzzer. Thus, if you turn on the ignition and have forgotten to turn on the hidden switch for the fuel solenoid, the buzzer will sound.

Fig.3 is a more complex option using the buzzer. The drawback with Fig.2 is that if you forget to turn off the fuel solenoid after turning off the ignition
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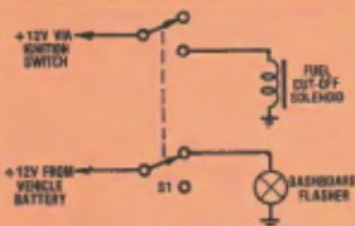


Fig.1: this circuit activates a dashboard flasher when the fuel is cut off.

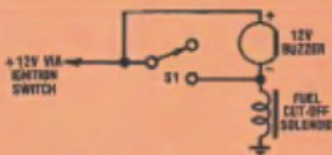


Fig.2: this circuit sounds a buzzer if you turn on the ignition but forget to also turn on the solenoid. A buzzer could also be added to the circuit shown in Fig.1.

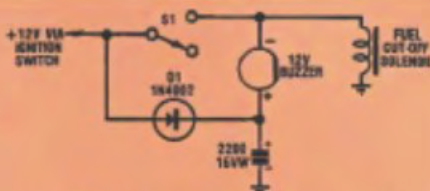



Fig.3: by adding a diode and a capacitor, the buzzer now also sounds briefly when the ignition is switched off, to remind you to switch off the solenoid.

Fuel cut-off solenoid — ctd from page 14

the ignition, the fuel solenoid will be automatically energised next time the car is started. Fig.3 fixes that problem.

Fig.3 works as follows. If the ignition is turned on and S1 is open, diode D1 will conduct to energise the buzzer and also charge the $2200\mu\text{F}$ capacitor. The buzzer current will pass through the solenoid but will not be enough to energise it. When S1 is closed, the solenoid will be energised and the buzzer will stop.

When the ignition is turned off, the $2200\mu\text{F}$ capacitor discharges and briefly sounds the buzzer. This acts as a reminder to turn off the fuel solenoid. 



Although the fuel cut-off solenoid can be installed in the engine compartment, it should ideally be hidden from view underneath the vehicle.